

APR 20 2007

Docket No.: 3095-009

PATENTREMARKS

Reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 43-73 remain pending in the application.

Claims 43-55 and 72 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. In response, claim 43 has been amended and it is believed that the rejection has been overcome. Accordingly, the rejection should be withdrawn.

Claims 43-55 and 72 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. In response, claim 43 has been amended and it is believed that the rejection has been overcome.

Claims 43-55 and 72 are rejected under 35(a) as being unpatentable over JP 05-201872 or Lawhon et al. (US 4,643,902) with evidence from Gobel et al. (US 4,491,600). Applicants respectfully traverse this rejection.

The device (herbal concentration) of the present invention is structurally different from the applied prior art (Gobel US patent No 4,491,600 and Lawbon et al US Patent No: 4,643,902) and is not disclosed in the hitherto known prior art. The novel and non-obvious features of the device are:

- (i) Spiral membrane module containing the TFC membrane assist in speedier concentration of aqueous solution under pressure in the range of 90 to 120 psi and at ambient temperature.
- (ii) The concentrated solution obtained from the module is re-circulated into the concentrate container such that it is directly added to less concentrate solution and is not allowed to come in contact with air. As a result, the froth formation does not take place.
- (iii) The device contains solenoid valves, which provide flow of extract solution, water and air during the concentration, wash and drain mode respectively. This arrangement initially concentrates the solution, recovers all the concentrate and then the washing cycle is immediately started to remove adhering substances on the membrane surfaces. This minimizes the problem of membrane bio-fouling.

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- (iv) The device has a miniature pressure pump which can operate in the pressure range of 90 to 120 psi as there is negligible increase in the osmotic pressure. This is mainly due to the absence of inorganic solutes in the extracts.
- (v) The device has an in-built air compressor which assist in removal of any hold up volume in the membrane module. The compressed air forces the hold up concentrate into the extract container. This helps to recover more than 95% of the concentrate solution.
- (vi) The present device simultaneously performs the processes like concentration, drawin and washing at ambient temperature, thereby prevents the degradation of temperature sensitive bioactive molecules present in the concentrate aqueous plant extract.

Lawbon et al US Patent No. 4,643,902 discloses a process which involves Ultra-filtration (UF) and reverse Osmosis (RO). In UF the liquid is passed through a membrane of definite pore size which allows smaller size molecules to pass and reject the bigger molecules. Lawbon found that passing the solution through RO membrane with some hydrostatic pressure is essential to overcome the osmotic pressure resulting from concentration differences on opposite side of the semi permeable membrane. The device and process adopted by Lawbon et al does not provide the teaching on how (i) speedier and effective concentration in short time, (ii) how froth formation be avoided and (iii) avoid bio-fouling and deterioration of RO membrane.

Gobel et al Us patent No. 4,491,600 discloses a process for concentration of aqueous solutions having temperature sensitive components which comprises the steps of (i) subjecting the aq solutions to an ultra-filtration procedure to provide a permeate solution and a residual solution; and (ii) subjecting the permeate solution to freezing and removing ice crystals formed.

The freeze concentrating units consists of a cooling part, an actual crystallizer – where the growth of ice crystals is facilitated, a suitable separation and washing unit for the ice formed. It is clearly explained in the Detailed Description of the Invention that parts of the freeze concentrating process are not crucial; however, it is important that the parameters influencing the freeze concentrate process such as freezing temperature, residence time in crystallizer and types of devices used are determined mainly on the composition of the solution to be concentrated and the optimal values and conditions are to be established by proper experimentation. In freeze concentration, it involves phase change, i.e. liquid to solid which acquires large amount of energy. Moreover, due to processes like ultra-filtration and freeze concentration the time required is greater. These are the main drawbacks which are technically solved in the present invention.

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Applicants submit that the basic process steps involved in both the prior art (Gobel US Patent No 4,491,600 and Lawbon et al. US Patent No: 4,643,902) and the process steps disclosed in the present invention are totally different. Moreover, the Applicant(s) have clearly stated the structural differences of the present device (system) along with its specific function/role that is not described in the cited prior art. Accordingly, the obviousness rejection should be withdrawn.

Early issuance of a Notice of Allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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